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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,222	10/21/2003	Yihong Gong	CA1216	9532

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EXAMINER

HESELTIME, RYAN J

ART UNIT	PAPER NUMBER
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2623

DATE MAILED: 04/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/691,222

Applicant(s)

GONG ET AL.

Examiner

Ryan J Hesseltine

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 18-30 and 48-72 is/are pending in the application.
- 4a) Of the above claim(s) 25,26,55,56 and 65-72 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 18-24,27-30,48-54 and 57-64 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/21/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 49-54, 57, 58 and 64 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claims 49-54 and 57 recite the limitation "The computer-readable medium" in line 1. There is insufficient antecedent basis for this limitation in the claim. It appears that applicant intended these claims to depend directly or indirectly from independent claim 48, which claims a computer-readable medium.

4. Claim 58 recites the limitation "said precedent in time frame" in line 3. There is insufficient antecedent basis for this limitation in the claim.

5. Claim 64 recites the limitation "The method" in line 1. There is insufficient antecedent basis for this limitation in the claim. This claim depends directly from claim 63, which describes a computer-readable medium and depends from claim 48.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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7. Claims 18, 24, 27-30, 48, 54 and 57-64 are rejected under 35 U.S.C. 102(b) as being anticipated by Nagasaka et al. (USPN 5,818,439, newly cited, hereafter Nagasaka).

8. Regarding claim 18, Nagasaka discloses a method for segmenting an input video sequence, said input video sequence comprising a plurality of frames, said plurality of frames being grouped into a plurality of video shots (column 2, line 37-42), said method comprising: (a) computing a similarity between each of said plurality of frames and a frame preceding said each of said plurality of frames in time (column 8, line 13-30); (b) segmenting (dividing) said input video sequence into said plurality of video shots according to said computed similarity (column 8, line 1-8).

9. Regarding claim 48, Nagasaka discloses a computer-readable medium containing a program (column 4, line 65-column 5, line 13) for segmenting an input video sequence, said input video sequence comprising a plurality of frames, said plurality of frames being grouped into a plurality of video shots (column 2, line 37-42), said program comprising: (a) computing a similarity between each of said plurality of frames and a subsequent in time (current) frame (column 8, line 13-30); (b) segmenting said input video sequence into a plurality of shots according to said computed similarity (column 8, line 1-8).

10. Regarding claims 24 and 54, Nagasaka discloses (c) extracting features (representative images) from each of said plurality of video shots (column 5, line 24-37; column 8, line 34-55).

11. Regarding claims 27 and 57, Nagasaka discloses that in said (b) said computed similarity (degree of difference R_{cp}) is compared to at least a first threshold similarity ($th1$) and a second threshold similarity ($th2$), and said input video sequence is segmented according to a result of said comparison (column 8, line 48-column 9, line 24).

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12. Regarding claims 28 and 58, Nagasaka discloses that if in said (b) said computed similarity (R_{cp}) is below a first threshold similarity ($th1$), said each of said plurality of frames is put into one of said plurality of video shots (one is added to n) containing said precedent in time frame (column 8, line 61-65).

13. Regarding claims 29 and 59, Nagasaka discloses that if in said (b) said computed similarity (R_{sum}) is above a second threshold similarity ($th2$), said each of said plurality of frames is designated as a shot boundary (column 8, line 65-column 9, line 3).

14. Regarding claims 30 and 60, Nagasaka discloses that if in said (b) said computed similarity (R_{cp}) is between a first threshold similarity ($th1$) and a second threshold similarity ($th4$), said each of said plurality of frames is put into one of said plurality of video shots according to a further analysis performed using additional frames from said plurality of frames (column 10, line 8-18).

15. Regarding claims 61 and 63, Nagasaka discloses (c) extracting features (representative images) from each of said plurality of video shots and using said extracted features to index said plurality of video shots (column 5, line 24-37; column 8, line 1-55).

16. Regarding claims 62 and 64, Nagasaka discloses that said extracted features are features of a video frame representative of said each of said plurality of video shots (column 5, line 24-37).

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 19-23 and 49-53 rejected under 35 U.S.C. 103(a) as being unpatentable over Nagasaka as applied to claims 18 and 48 above, and further in view of Lim (USPN 6,574,378, newly cited).

19. Regarding claims 19, 20, 49 and 50, Nagasaka does not disclose that said similarity is calculated using a refined feature space representation of said input video sequence, or that said refined feature space representation is created using a singular value decomposition of said input video sequence. Lim discloses a method and apparatus for indexing and retrieving images using visual keywords wherein during indexing (or retrieval) of a visual document, a spatial aggregation map (SAM) of occurrences of visual tokens is created which represents a visual-content signature for the visual document (column 9, line 14-28). Subsequently, the SAM is input to a singular-value-decomposition (SVD) based coding module to produce a refined feature (reduced dimensionality) space representing a coded description of a visual document wherein a frequency matrix X associates visual keywords and visual documents by concatenating linearized SAM vectors of visual documents as column vectors of the matrix X (column 9, line 29-37). It would have been obvious to one of ordinary skill in the art at the time the invention was made to obtain a refined feature space using a singular value decomposition of an input video sequence as taught by Lim in order to reduce the dimensionality and possibly the noise in the spatial aggregation map to produce a coded description of a visual document (column 9, line 29-33).

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20. Regarding claims 21 and 51, Nagasaka discloses that said singular value decomposition (see above discussion of claims 20 and 50) is performed using frames selected with a fixed interval from said input video sequence (column 9, line 61-column 10, line 18).

21. Regarding claims 22 and 52, Lim discloses that said selected frames (linearized SAM vectors) are arranged into a feature frame matrix (X), and wherein said singular value decomposition is performed on said feature frame matrix (column 9, line 33-44).

22. Regarding claims 23 and 53, Lim discloses that said singular value decomposition produces a matrix (X), each column of said matrix comprising a frame (SAM vectors of visual documents) in a refined feature (reduced dimensionality) space corresponding to a frame in said input video sequence (column 7, line 33-44).

Conclusion

23. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- USPN 5,734,735 to Coleman, Jr. discloses a method and system for detecting the type of production media used to produce a video signal including computing an inter-image similarity value for each segmented video image.
- USPN 5,911,008 to Niikura et al. discloses a scheme for detecting shot boundaries in compressed video data using inter-frame/inter-field prediction coding and intra-frame/intra-field coding including inter-field similarity to determine a shot boundary.
- USPN 5,956,026 to Ratakonda discloses a method for hierarchical summarization and browsing of digital video.

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- USPN 6,172,685 to Pandit discloses a method and apparatus for increasing the amount and utility of displayed information including calculating an information content factor for each frame in a video.
- USPN 6,195,458 to Warnick et al. discloses a method for content-based temporal segmentation of video.
- USPN 6,393,054 to Altunbasak et al. discloses a system and method for automatically detecting shot boundaries and key frames from compressed video data.
- USPN 6,404,925 to Foote et al. discloses methods and apparatuses for segmenting an audio-visual recording using image similarity searching.
- USPN 6,496,228 to McGee et al. discloses significant scene detection and frame filtering for a visual indexing system using dynamic thresholds.
- USPN 6,535,639 to Uchihachi et al. discloses automatic video summarization using a measure of shot importance and a frame-packing method.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 571-272-7419.

The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 571-272-7414. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan J. Hesseltine
March 22, 2005



JINGGE WU
PRIMARY EXAMINER